

PCT

10/553475

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference FE6101 PGU	FOR FURTHER ACTION	See item 4 below
International application No. PCT/EP2004/004003	International filing date (<i>day/month/year</i>) 14 April 2004 (14.04.2004)	Priority date (<i>day/month/year</i>) 17 April 2003 (17.04.2003)
International Patent Classification (IPC) or national classification and IPC C08F 10/06		
Applicant BASELL POLYOLEFINE GMBH		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).
2. This REPORT consists of a total of 7 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

<input checked="" type="checkbox"/> Box No. I	Basis of the report
<input checked="" type="checkbox"/> Box No. II	Priority
<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/> Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/> Box No. VI	Certain documents cited
<input checked="" type="checkbox"/> Box No. VII	Certain defects in the international application
<input checked="" type="checkbox"/> Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 740 14 35	Date of issuance of this report 21 October 2005 (21.10.2005)
	Authorized officer Ellen Moyse Telephone No. +41 22 338 89 75

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

REC'D 26 AUG 2004

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To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing

(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION

See paragraph 2 below

International application No.
PCT/EP2004/004003

International filing date (day/month/year)
14.04.2004

Priority date (day/month/year)
17.04.2003

International Patent Classification (IPC) or both national classification and IPC
C08F10/06

Applicant
BASELL POLYOLEFINE GMBH

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/EP2004/004003

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
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Box No. II Priority

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	3-11
	No: Claims	1,2,12
Inventive step (IS)	Yes: Claims	
	No: Claims	1-12
Industrial applicability (IA)	Yes: Claims	1-12
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

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Re Item V.

Reference is made to the following documents:

D1: US A 5759940 (cited by the applicant as WO95/26369)

D2: WO A 01/44319 (cited by the applicant)

D3: US A 5589549

D4: EP A 0519342

D5: US A 4399054 (cited by the applicant)

1. Novelty (Art. 33(2) PCT)

1.1. The subject-matter of claims 1,2,12 is not novel in view of D2 and D3. The reasons as follows.

D2 and D3 disclose a polymerisation process for olefin (e.g. propylene) carried out in the presence of at least one metallocene supported on a porous polymer and partially carried out in the presence of hydrogen as claimed in present claims 1 and 2 (see search report).

Note that the term "porous polymer" in present claim 1 is a relative and vague term, which does not specify the degree or the nature of the porosity (e.g. porosity on the polymer surface, or on the core). Thus also the polymers prepared in D2 and D3, prepared from a porous prepolymers could maintain a certain degree of porosity according to claim 1.

The same consideration can apply to the wording "total porosity" in claim 12.

This product claim 12 furthermore appears to be not novel in view of D2 and D3 for the following reasons. In D2 and D3 the propylene polymers present narrow MWD and melting points as claimed. In D2 the MWD is not explicitly mentioned but a supported metallocene is used, thus a narrow MWD can be supposed. In D3 no melting point of the polymers is defined, but it is known that propylene polymers have normally T_m higher than 100°C.

Thus the subject-matter of claims 1,2,12 is not novel in view of D2 and D3.

1.2. The subject-matter of claims 3-11 is novel in view of D2-D3 for the following reasons.

D2-D3 describe polymerization processes using the same catalyst systems (supported metallocenes on organic porous polymers) but different polymerization conditions for the preparation of the olefin polymers, wherein the use of hydrogen as claimed during the polymerisation stage with the metallocenes is not explicitly disclosed (see search report).

Thus the subject-matter of claims 3-11 is novel in view of D2-D3.

2. Inventive Step (Art. 33(3) PCT)

The subject-matter of claims 1-12 does not involve an inventive step in view of D1-D5 for the following

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reasons.

2.1. Being not novel, the subject-matter of claims 1, 2, 12 cannot be regarded as inventive either.

2.2. Furthermore as for claims 3-11, documents D2 and D3 are considered as the closest prior art and disclose polymerisation processes as mentioned above (see 1.1. and also D1, search report)).

The present application differs from D1-D3 in that the propylene polymerisation catalysed by a supported metallocene is carried out in the presence of hydrogen.

According to the present examples on file the technical effect deriving from the use of the distinguishing feature above (hydrogen added during the polymerisation with supported metallocene) results in the increasing porosity and in the decreasing bulk density of the final propylene polymer (see examples on file, tables 2 and 3) over the prior art (see comparative example 1 on file, table 2).

The problem to be solved by the present invention may therefore be regarded as the provision of a polymerisation process for preparing propylene polymers having increased porosity and decreased bulk density.

The solution proposed in claims 3-11 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) for the following reasons.

The use of hydrogen during the polymerisation of olefins in the presence of supported Z-N catalyst in order to get porous polymers is well known in the art.

In D4 and D5, porous propylene polymers are disclosed from polymerisation processes carried out in the presence of comparable Z-N supported catalyst and hydrogen (see examples in D4 and D5 and search report).

Note that even in D1-D3 the first part of the polymerisation, wherein a porous polymer is needed, is carried out in the presence of hydrogen, (see examples in D1-D3 and search report).

Therefore the skilled person trying to prepare a porous propylene polymer and starting from D1-D3 would have found a hint in D4-D5 and D1-D3 as well, to add hydrogen to the polymerisation system in order to solve the problem.

Thus the subject-matter of claims 3-11 does not involve an inventive step.

3. The subject-matter of claims 1-12 meets the requirements of **Article 33(4) PCT**, with regard to industrial applicability.

Re Item VII.

1. Contrary to the requirements of **Rule 5.1(a)(II) PCT**, the relevant background art disclosed in the

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International application No.

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documents D3 and D4 is not mentioned in the description, nor are these documents identified therein.

Re Item VIII.

The following clarity objections are raised (**Article 6 PCT**).

1. Although claims 1 and 3 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.
2. The term "porous" referring to the propylene polymer in claim 1 is a relative term and renders the claim unclear (see claim 12).
3. The standard methods or at least the conditions for measuring the porosity and the MWD of the polymer (claims 5,6,12) are not mentioned in the claims (see page 13 of the description).
4. The publication number of the patent application PCT/EP02/13371 on page 1 is not mentioned.